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ABSTRACT

This study hypothesizes that a sense of personal and teaching efficacy can be explained, in part, by a historical pattern of student achievement performance and workplace context. To measure perceptions of efficacy, power, and school climate, a questionnaire was completed by approximately 1,500 elementary school teachers in the spring terms of 1991, 1992, and 1993. Achievement scores on the Iowa Tests of Basic Skills for 5 years preceding the first survey determined students' historical achievement performance. Findings indicated that context was an important influence on teaching efficacy; that a positive school atmosphere (focused on instruction), the reduction of barriers to effective teaching, and classroom-based decision-making each contributed to teachers' sense of teaching efficacy; and that schools with historically poor achievement tended to have teachers who reported a poorer image of school atmosphere which contributed to poorer perceptions of teaching effectiveness. Results suggest opportunities for improving the self-view of teachers and their profession. Specific recommendations include improvement of the instructional focus and climate of schools and provision of greater opportunity for teachers to participate and be influential in instructional and curricular decisions. A path diagram linking context variables to teaching efficacy is appended. (Contains 23 references.) (LL)

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ED 370 919

# Exploring the Context of Teacher Efficacy:

# The Role of Achievement and Climate

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**Exploring the Context of Teacher Efficacy:**

**The Role of Achievement and Climate**

Restructuring, as the latest educational reform movement is called, proposes a re-conceptualization of the teacher's role in the educational enterprise and has led many local education agencies (LEA) to institute practices assuring greater teacher involvement in district- and building-level decision-making and policy creation. It has been claimed that restructuring will bring teachers opportunities that instill a renewed sense of professionalism and self-efficacy. While researchers question the theoretical nature of efficacy, reformists view the construct as a policy-relevant alterable characteristic of the educational context. Restructuring is theorized to benefit learning and achievement outcomes as a function of improved teacher work conditions (context), self-worth, and greater instructional decision-making authority.

While many studies have demonstrated a relationship between achievement outcomes and teacher, classroom and school level inputs it is unclear whether a direct causal relationship exists between these variables or whether there is a reciprocal influence. Holding efficacious beliefs is likely a pretext for engaging in outcome-sensitive teaching behaviors. Efficacy literature lends support to the notion that high efficacy teachers have high academic standards for students, focus on instruction, keep students on-task, and have students with high achievement performance (Ashton, 1983; Armor, et al., 1976). But what in the workplace contributes to efficacy? Some evidence suggests that student characteristics play a role. Ashton (1985) notes that ". . . [S]tudent ability appears to be the single most significant student characteristic affecting a teacher's sense of efficacy" (see also Cooper & Good, 1983; Prawat & Jarvis, 1980). Research has not explored the potential for a reciprocal relationship between efficacy and context. What is not known is whether efficacious beliefs influence the context or characteristics of the educational system or whether the educational system influences teacher efficacy. Furthermore, while researchers have documented the relationship between teacher efficacy and student

achievement performance, it is unclear whether student performance can reinforce or erode teacher efficacy.

## OBJECTIVES OF STUDY

This study examined the relationships among two dimensions of teacher efficacy (personal and teaching; Berman, McLaughlin, Bass, Pauly and Zellman, 1977) and achievement performance. Furthermore, context variables such as teacher power, school climate, staff collegiality and instructional impediments were explored for their influence upon teacher efficacy. The study was guided by the following hypotheses:

H1: Sense of teaching efficacy can be explained, in part, by the historical pattern of achievement performance and workplace context.

H2: Sense of personal efficacy can be explained, in part, by the historical pattern of achievement performance and workplace context.

## THEORETICAL FRAMEWORK

Ruscoe, Gaus and Esselman (1992) have provided suggestions for efficacy research by encouraging investigators to consider the theoretical notions of efficacy and the need to establish the policy-relevance of this construct. At least three central questions have been advanced: 1) Is efficacy a situation-specific attitude changing with circumstances and events (implicit in Bandura, 1978) or a relatively stable personality trait (implicit in Rotter, 1966)?; and 2) If efficacy is a policy-relevant construct then it must, to some extent, be related to student outcomes and be observed in teacher behavior (Ruscoe et al., 1992). Is efficacy related to student outcomes?; and 3) If efficacy is alterable what in the workplace context contributes to a stronger sense of efficacy? Ruscoe et al., note that the theoretical orientation one assumes has important implications for educational research and intervention.

Specifically, if efficacy is a personality trait it may not be amenable to modification and should not be considered policy-relevant for educational reform. Alternately, if efficacy is highly fluid, changing daily, then it may not be possible to intervene with teachers to strengthen their sense of efficacy. Recently, some evidence has been presented to answer these questions.

Moore & Esselman (1992) found efficacy statistically unchanged over four months for the staff of seven elementary schools; although the change from measure to measure was more than 10 times as large for attitudes of personal efficacy ($p=.06$) as it was for teaching efficacy ($p=.88$). Alternately, Bandura's efficacy framework has been validated by the findings of other less recent investigations (Ashton & Webb, 1986; Evans & Tribble, 1986; Gibson & Dembo,1984; Tracz & Gibson, 1986).

The link between achievement and teacher beliefs and practices has been documented for a variety of outcomes and constructs. Schneider (1986), in a study of the quality of education received by students, found differences in student achievement gains effected by teacher, school, and community characteristics. Others (Ashton, 1985; Armor et al., 1976; Brookover, Schweitzer, Schneider, Beady, Flood, & Wisenbaker, 1978; Brophy, 1982; Hillman, 1984; Moore & Esselman, 1992; Rutter, Maughan, Mortimore, & Ouston, 1979) note a link between teacher sense of efficacy and student achievement, although the nature and extent of these relationships have yet to be fully understood.

Evidence gathered from classroom observations indicates that high and low efficacy teachers behaviorally differ in ways that effect student outcomes (Ashton, Webb & Doda, 1983; Gibson & Dembo, 1984). While these results suggest that efficacy and other context variables influence achievement performance, what has not been fully investigated is how achievement and context influence efficacy. Some research suggests a link. Ashton et al. (1983), Fuller, Wood, Rapoport and Dornbusch (1982), and Moore and Esselman (1992) have found some organizational context differences associated with efficacy (e.g., middle school versus junior high school and magnet school versus traditional elementary school).

The notion of environment influencing attitudes and performance has roots in environmental psychology, sociology and occupational therapy where individuals are viewed to be interdependent with their physical environment or the context of their behavior and attitudes (Holahan, 1986; Wicker, 1979). Dunn, Brown, and McGuigan (in press) have developed a framework (The Ecology for Human Performance) for understanding the performance of individuals within their context. Their framewc considers the person, context, task, and performance as well as the relationships among these dimensions. Context could be extended to encompass temporal, social and cultural elements in our schools. Dunn et al (in press) note: "An underlying assumption . . . is that ecology, or the interaction between person and the environment, affects human behavior and performance, and that performance cannot be understood outside of context" (p. 9). Bruner (1990) has elaborated on the relationship between self and environment. He conceptualized this interaction as a process of self-definition in the context of the environment. Consequently, teachers may be forming their sense of efficacy through their interactions within the context of their workplace. This formation and elaboration of efficacy may be dependent upon such factors as the amount of time spent employed in a particular school, the socio-collegial environment, the extent of teacher involvement in organizational policy creation and classroom decision-making, and the professional, as well as educational culture of the school.

Using Bandura's (1978) conceptualization of efficacy as two separate generalizations representing personal efficacy (an internal sense that a teacher can effect positive learning outcomes in students) and teaching efficacy (an external sense that all students can learn and teachers as a group can effect this process of learning) we explored the degree of influence of the historical pattern of: 1) student achievement in the school and 2) the context of the workplace (teacher perceived power, impediments to effective instruction, and climate for learning) upon sense of teaching and personal efficacy of teachers. Based on a review of the literature we theoretically view teachers as having a

relatively stable but potentially alterable sense of efficacy that can be influenced by the context of the workplace and the achievement performance of students.

## METHODS

### Sample

Teachers and students in one Midwestern, urban school district provided data for this effort. Measures of teacher feelings of efficacy, perceptions of power, and school climate were gathered through a questionnaire instrument distributed to all teachers (N=2,600±100) in the spring terms of 1991, 1992 and 1993. The instrument was mailed to teachers in the schools. Teachers were assured of anonymity in their response. Only school and grade level (e.g., k-2, 3-5, 6-8, 9-12) identification was requested. Responses to items were returned by more than 1,500 teachers annually ($n_{1991}$ = 1,802; $n_{1992}$ = 1,811; $n_{1993}$ = 1,570). However, because achievement data and teacher data are the focus of this study, we targeted elementary school teachers. It was expected that elementary teachers may be more prone to self-definition and alteration of efficacy because they spend virtually all day, every school day, with the same class of students. Student performance on achievement examinations may potentially influence teacher self-worth and self-efficacy because of this close relationship with students. As such, only students and teachers in grades 3 through 5 were considered in explanatory analyses ($n_{teachers}$ = 358 (1991); 384 (1992); 357 (1993). Demographic information was obtained through a series of initial questions.

### Instrumentation and Data Sources

The instrument, containing 66 closed-ended items, is a revised version of one originally developed Ruscoe, et al., (1989). Over the course of three years of administration, the instrument has evolved with the addition of new items and the deletion of others. However, the core items used to measure teacher sense of efficacy, power, and school climate have remained unchanged (see Attachments to manuscript).

*Instrument reliability*. Through a principal components rotated oblique factor analytic solution the 66 questionnaire items were associated with seven context variable dimensions. The factor structure has been validated for stability and reliability across the three years of survey administration (see Table 1). Factor analysis found two dimensions for efficacy: teaching and personal. Across three years of survey data, internal consistency reliability for teaching efficacy ranged from .74 to .77 using Cronbach's Alpha (standardized). Alphas' for personal efficacy ranged from .64 to .67. Teacher power was found to have two dimensions (classroom-based and school-based decision-making). However, in the third year of data collection the factor analysis extracted one factor for teacher power (Alpha =.81). School-based decision-making during the first two years of data collection had alpha values of .75 and .80 respectively. Classroom-based decision-making internal consistency was .69 in the first year and .63 in the second year. Factor analysis results for the school instructional climate variables resulted in three separate dimensions. These dimensions were extracted each year. The first factor, Positive School Atmosphere had internal consistency reliabilities ranging from .74 to .88. The second factor, Lack of Impediments to Effective Instruction, had alpha values ranging from .45 to .59. The final factor, Collegiality, demonstrated moderate internal consistency with Cronbach Alpha values ranging from .65 to .71.

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Insert Table 1 about here

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*Achievement data*. Achievement scores on the Iowa Tests of Basic Skills (ITBS) for the five years (1987-1991) preceding the first survey administration were collected from district Testing Office computer files. Reading and mathematics achievement were aggregated into median grade equivalent scores by school for all elementary schools and grades three through five. Historical achievement performance was determined by

examining published grade-level national norms. A single index was calculated indicating how many testing years out of five the school was below the national norm by more than 5 months at grades three through five.

**Analysis**

In order to test the hypotheses that teacher sense of efficacy is, in part, predicted by workplace context variables and historical achievement performance of students, all data were aggregated to the grade within school level (19 schools were included in the data files). Context data secured from the questionnaire was factor analyzed with all cases included in the analysis (i. e., elementary, middle, senior high teachers). Scales were created based on the oblique rotation solution. Scale scores were created and standardized to have a mean of 50 and a standard deviation of 10. Scores were then aggregated to the school level.

Preliminary linear regression indicated that years teaching experience, degree attainment and teacher gender (percent male staff) were non-significant predictors of teaching efficacy. As such, these variables were not included in path analysis model testing. Analysis consisted of an examination of descriptive statistics, regression-based path analysis of efficacy with teaching efficacy as the criterion variable. Path analysis was intended to identify the significant direct effects of historical reading and mathematics performance, context variables (power, positive school atmosphere, and barriers to effective learning and teaching), as well as exogenous school context variables such as pupil-teacher ratio, and school enrollment.

## RESULTS

**Response Rate and Demographics**

Responses to the survey instrument were similar in 1991 and 1992 (n91=1802; n92=1811) but declined in 1993 (n=1570) (see Table 2). Respondent demographics did not vary significantly across years for gender, years of teaching experience and degree attainment. The sample was approximately 73% female and 27% male. The modal years of

teaching experience exceeded 15 years. Teachers in the sample were found to have increasing training across time with declining numbers of teachers with a BA (44.6% to 40.2%) or MA (25.4% to 23.6%) and increasing numbers having a Masters + 15 hours or more (28.2% to 35.4%).

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Insert Table 2 about here

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**Historical Achievement Performance**

Examination of historical achievement performance for elementary magnet schools with grades three through five (n=19) indicated that approximately 30% had positive achievement performance (no grade levels below norm) across five years. Similarly, 47% had no grade levels below the national norm in mathematics across five years of testing.

**Relationships Among Context and Achievement Variables**

Correlations reported were based on data aggregated to the school level. Pearson correlations between context variables and historical achievement performance for the most recent data (1993) indicated significant associations. Reading achievement performance (performance above norm aggregated to the grade within school level) was significantly related to teacher perceptions of personal efficacy (r=.35; p= .03), influence in decision-making (r=.54; p=.000), positive school climate (r=.76; p=.000), staff collegiality (r=.58; p=.000) and minimal barriers to effective teaching (r=.71; p=.000). Reading achievement was non-significantly related to teaching efficacy (r=.22; p=.17). Historical math performance was non-significantly related to efficacy (teaching: r=.11; p=.48; personal: r= .27; p=.09), but significantly related to all other context variables (see Table 3).

Insert Table 3 about here

**Historical Context**

Using a repeated measures analysis of variance approach with each context dimension examined, the analysis tested for changes in teachers' perceptions of the context of the workplace across three years of data (1991 to 1993). Again, the level of analysis was the school. Changes in teacher efficacy were examined for teaching and personal efficacy. The results support those reported by Moore and Esselman (1992) who found that efficacy was statistically unchanged within one academic year. In the current study, the multivariate test for changes in teaching efficacy was non-significant (Wilks = .870; Exact F=2.82; p =.07). Personal efficacy also was found to be statistically unchanged over the course of three years of school level data (Wilks = .92; Exact F = 1.61; p = .21).

As noted earlier, the teacher power dimensions were stable in 1991 and 1992. However, in 1993, these two dimensions (classroom-based and school-based decision-making) collapsed into one dimension we labeled as decision-making power. Repeated measures analysis of teacher power used only the 1991 and 1992 data. Non-significant changes were observed for school-based decision-making (F=1.26; p≤ .27) as well as classroom-based decision-making (F=3.66; p≤ .06).

The three school climate factors (i. e., positive school atmosphere, teacher collegiality, minimal barriers to effective teaching) were extracted using factor analysis, as described earlier, across the three years of data collection. A positive school atmosphere was found statistically unchanged for the staff of schools across three years of data (Wilks = .86; Exact F = .3.04; p≤ .06). Similarly, the perception of minimal barriers to effective teaching was found to be statistically unchanged as well (Wilks = .94; Exact F = 1.28; p≤ .29). Lastly, teacher collegiality was found to have statistically changed during the three years examined (Wilks =.83; Exact F = 4.00; p≤ .03). However, the significant change was

found between 1991 and 1992 (F = 7.81; p≤ .008) but was not observed for the change from 1992 to 1993 (F = .85; p≤ .36).

**Path Model of Teacher Sense of Efficacy**

Regression-based path analysis was used to test the model that teaching efficacy is explained, in part, by teachers' sense of personal efficacy, decision-making influence, and school climate factors (minimal barriers to teaching effectiveness and a positive school climate). Because non-significant changes were observed for most context variables we chose to use the most recent estimates of teacher perceptions of workplace context in our path model (e.g., 1993). Additionally, because the factor structure for teacher power was not replicated across time, we chose to use the 1993 dimension (decision-making influence) which is a combination of the two dimensions of teacher power. Lastly, because teacher collegiality was statistically changed from 1991 to 1992 but not significantly different in 1993, we chose to exclude this variable in the path model.

Because historical achievement performance was measured across the five years prior to survey administration, we treated achievement performance as an exogenous context variable theoretically similar to organizational characteristics in the school. Since it is historical, it cannot be altered, but may be viewed by teachers and school district leadership as benchmark data upon which to judge school effectiveness and, potentially, teacher effectiveness.

Results indicated that historical reading achievement performance had a significant indirect effect upon teacher sense of teaching efficacy through the mediating variables of Positive School Atmosphere and Minimal Barriers to Teaching Effectiveness (see Figure 1; positive path coefficients less than .10 were removed for clarity). This result suggests that teachers are influenced by historical reading achievement performance in their school but only through the expression of a positive school atmosphere with minimal barriers to instruction. The relationships indicate that school atmosphere is more positive when the school has had fewer years below the National norm on the ITBS reading test ($p$ = -.25; p≤

. 009). Teaching efficacy is directly influenced by the teachers' perception that the school has minimized barriers to teacher effectiveness ($p = .93$; p≤ .000). In addition, Personal Efficacy directly influenced teachers' sense of teaching efficacy ($p = .81$; p≤ .000). Math achievement performance was also a significant predictor of Teaching Efficacy but was mediated through Classroom Decision-Making Influence and Personal Efficacy. In terms of exogenous context variable contribution, the only variable with a significant direct effect was that for Pupil-Teacher Ratio where, unexpectedly, a higher ratio was found to have a significant and positive direct effect on Teaching Efficacy ($p = .35$; p≤ .000).

In summary, the results suggest that historically below-norm achievement performances, both reading and mathematics, have a detrimental effect on school atmosphere. Through mediating relationships, achievement is capable of influencing teacher sense of Personal and Teaching Efficacy. However, other contextual features of the workplace contribute greater explanatory power for efficacy. These significant features include the minimization of perceived barriers to effective teaching, enhancing teacher authority to make instructional and curricular decisions, and creating a positive school atmosphere in which to work.

## EDUCATIONAL IMPLICATIONS

The results of this investigation revealed that teacher efficacy, both personal and teaching, were influenced by the context of the workplace. In the case of personal efficacy (sense that the individual teacher can affect positive learning changes in students) enhancing classroom-based decision-making authority was found to be a positive influence on personal efficacy. Personal efficacy was also strongly influenced by the historical achievement performance of students in mathematics, albeit indirectly through influence in decision-making.

Teaching efficacy (sense that children can learn and teaching as a profession can affect this outcome) was found to be strongly influenced by the historical achievement

performance of students. Both reading and mathematics historical performance was indirectly influential in teachers' sense of teaching efficacy. Context was found to be an important influence on teaching efficacy as well. A positive school atmosphere (focused on instruction), the reduction of barriers to effective teaching, and classroom-based decision-making influence each contributed to teacher sense of teaching efficacy.

From the perspective of reform and restructuring action in elementary schools the results suggest possible opportunities for improving the self-view of teachers and their profession. In particular, improving the instructional focus and climate of schools, removing unwarranted interruptions and paperwork and providing greater opportunity for teachers to participate and be influential in instructional and curricular decisions may positively influence the efficacy of teachers. This is important for two reasons: 1) efficacy and achievement are strongly related; and 2) teachers who believe they can affect positive changes in students will be more likely to engage in outcome-sensitive instructional behaviors. Alternately, the importance of the historical pattern of achievement performance for understanding teacher self-worth and efficacy cannot be minimized. Results suggest that those schools with historically poor achievement tend to have teachers who, as a group, report a poorer image of school atmosphere which contributes to poorer perceptions of teaching effectiveness. Furthermore, path analysis suggests that this weak sense of efficacy is in part a function of the poor performance of the school's students. What is of concern is the circular nature of this relationship. Entering teachers have substantially stronger personal efficacy than do long-term teachers (Dembo & Gibson, 1985) but as time passes (sometime after the tenth year of experience) teacher efficacy begins to decline. If the context of the previous ten years has been one of poor achievement performance of students, teachers likely will be self-defining (Bruner, 1990) themselves within the context of failure and frustration. This may well lead to the engagement in instructional practices and attitudes detrimental to student performance.

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Table 1

Internal Consistency Reliability for Context Variables Across Three Years

| Dimension<br>Scale Label | 1991<br>(N = 1,802) | 1992<br>(N = 1,811) | 1993<br>(N = 1,570) |
|---|---|---|---|
| **Teacher Efficacy** | | | |
| Personal Efficacy | .67 | .66 | .64 |
| Teaching Efficacy | .77 | .75 | .74 |
| **Teacher Power** | | | |
| School-Based | .75 | .80 | -- [a] |
| Classroom-Based | .69 | .63 | -- [a] |
| Decision-Making Influence | -- [b] | -- [b] | .81 |
| **School Climate** | | | |
| Positive School Atmosphere | .88 | .74 | .80 |
| Minimal Barriers to Effective Instruction | .59 | .45 | .47 |
| Teacher Collegiality | .71 | .68 | .65 |

Note: All reliability coefficients were obtained through Cronbach's Alpha procedure and are standardized.

[a] In 1993 the factor analytic solution did not identify this factor. The factor was not measured with 1993 teachers.

[b] This factor was not identified in 1991 or 1992. It was found when data were factor analyzed in 1993. It replaced the other two power factors.

Table 2

Demographic Characteristics of Sampled Teachers Across Three Years

| Characteristic | 1991 (N = 1,802) | 1992 (N = 1,811) | 1993 (N = 1,570) |
|---|---|---|---|
| **Level Taught** | | | |
| High School | 23.0 | 27.6 | 26.5 |
| Middle School | 21.3 | 21.1 | 21.9 |
| Elementary School | 51.9 | 49.0 | 49.0 |
| **Grade Level Taught** | | | |
| Pre-kindergarten-Kindergarten | 8.4 | 7.2 | 6.3 |
| First-Second Grade | 13.3 | 14.5 | 12.6 |
| Third-Fifth Grade | 19.9 | 20.9 | 29.3 |
| Sixth-Eighth Grade | 21.6 | 23.9 | 23.6 |
| Ninth-Twelfth | 25.0 | 33.5 | 28.2 |
| **Gender** | | | |
| Female | 74.3 | 71.0 | 72.7 |
| Male | 24.7 | 29.0 | 27.3 |
| **Years Teaching Experience** | | | |
| 1 year or less | 5.0 | 3.9 | 3.1 |
| 2 to 5 years | 18.9 | 20.5 | 16.8 |
| 6 to 9 years | 16.0 | 16.5 | 17.3 |
| 10 to 14 years | 16.6 | 15.3 | 16.6 |
| 15 years or more | 42.6 | 43.9 | 46.2 |
| **Degree Attainment** | | | |
| Less than Bachelors | .8 | .7 | .8 |
| Bachelors | 44.6 | 43.0 | 40.2 |
| Masters | 25.4 | 24.6 | 23.6 |
| Masters + 15 | 8.5 | 9.0 | 10.5 |
| Greater than Masters + 15 | 19.7 | 22.6 | 24.9 |

Note: Percentages may not sum to 100% due to unreported data and rounding error.

Table 3

Relationships Between School-Wide Historical Achievement Performance and Faculty Perceptions of Efficacy, Power, and School Climate

| Third Year Perception of Context | Yrs Above Norm [a] Reading | Yrs Above Norm [a] Mathematics |
|---|---|---|
| **Teacher Efficacy** | | |
| Personal Efficacy | .35* | .27 |
| Teaching Efficacy | .22 | .11 |
| **Teacher Power** | | |
| Decision-Making Influence | .54*** | .58*** |
| **School Climate** | | |
| Positive School Atmosphere | .76*** | .71*** |
| Minimal Barriers to Effective Instruction | .58*** | .63*** |
| Teacher Collegiality | .71*** | .49** |

Note: Achievement performance and context variable data have been aggregated to the school level.

[a] Years, out of five, preceding first questionnaire administration in which school was below the national norm on the Iowa Tests of Basic Skills by at least 5 grade-equivalent months at grades three through five.

*** $p \leq .000$. ** $p \leq .001$. * $p \leq .05$.

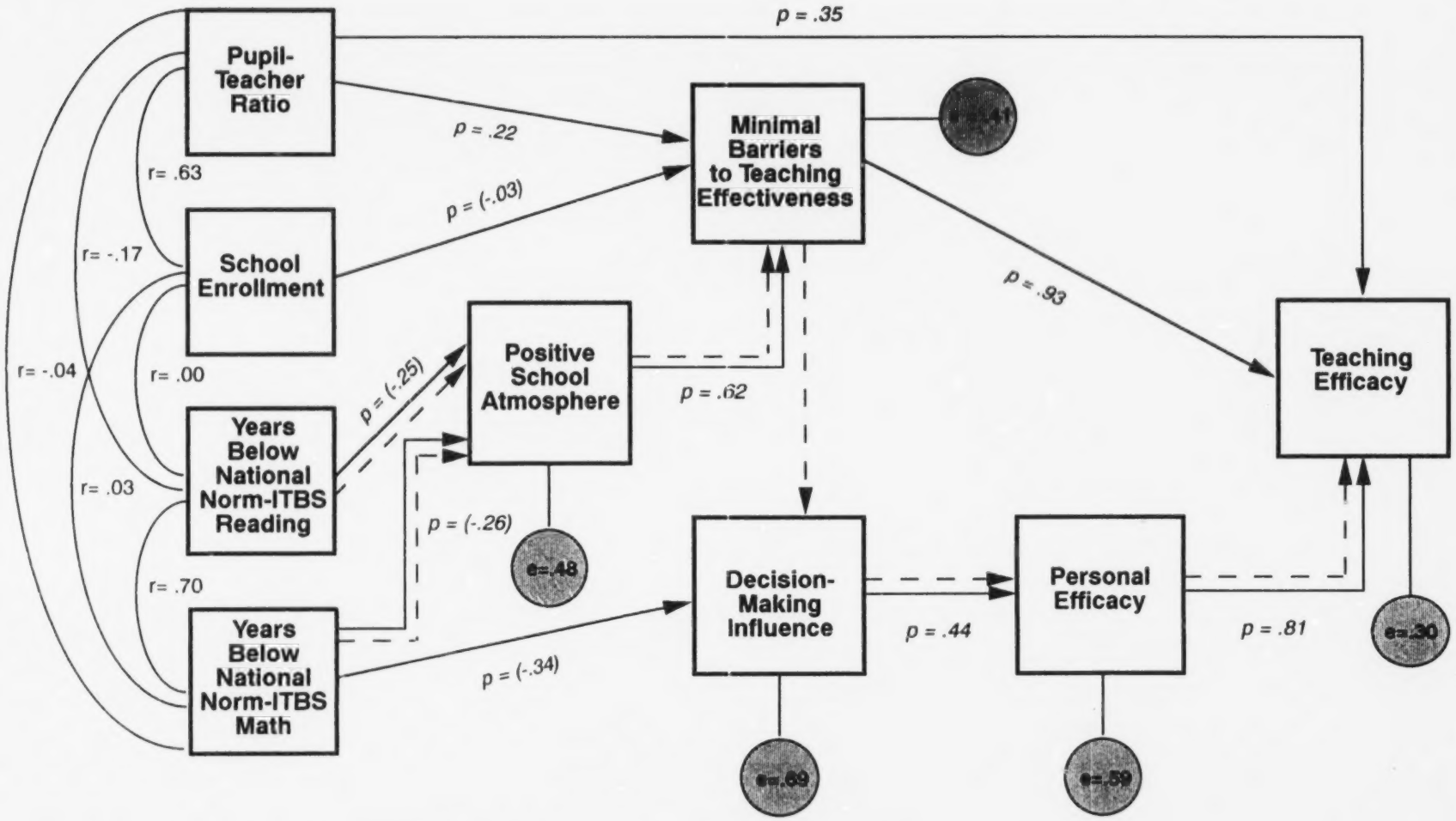


**Figure 1.** Path diagram linking context variables to teachers' sense of teaching efficacy. Significant path coefficients (p), untested correlations, and residuals (e) are shown. All data are aggregated to the school level.

— — — Hypothesized path
——— Observed path